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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,121	11/14/2001	Ronald Hilton	AMDH-08156US0 DEL	4641
21603	7590	03/07/2008		
DAVID E. LOVEJOY, REG. NO. 22,748			EXAMINER	
102 REED RANCH ROAD			SILVER, DAVID	
TIBURON, CA 94920-2025				
			ART UNIT	PAPER NUMBER
			2128	
			MAIL DATE	DELIVERY MODE
			03/07/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/992,121	<b>Applicant(s)</b> HILTON, RONALD	
	<b>Examiner</b> DAVID SILVER	<b>Art Unit</b> 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. The Instant Office Action is in response to a Request for Continued Examination filed 1/31/2008.
2. Claims 1 and 3-14 are currently pending in Instant Application.

***Priority***

3. Priority is not claimed (**Effective Filing: 11/14/2001**).

***Response to Arguments******Response: 35 U.S.C. § 101*****4. Applicants argue:**

13.5.1. A real-world result occurs in claim 1 (and all the claims) in that legacy instructions, which can be executed in a legacy-instruction computer, are emulated in another computer by execution of translated instructions. The tangible result is execution of translated instructions that thereby emulate the execution of legacy instructions. Emulation of legacy instructions cannot be questioned as being a real-world result. The result of the emulation is the same result achieved when the legacy instructions are executed in a legacy-instruction executing computer.

13.6.1. Of course, the operation in accord with claim 1 is repeatable and produces the same result time after time. The emulation of claim 7 achieves the identical result over and over again.

(Remarks: page

10)

**5. Examiner Response:**

Regarding subsection 1 *supra*, Applicants admit that the result of the claimed invention is "the same result achieved when the legacy instructions are executed". Applicants' admission results in a deficiency in both real-world result as well as concreteness of the final result.

The real-world result is based on the legacy program. When the legacy program does not produce a tangible final result (such as a broken legacy program containing an infinite loop which never exits / provides output), the result of the claimed invention does not have a real-world value. Furthermore, legacy program can contain non-deterministic states and therefore can contain states which are

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unstable/non-repeatable; thus, the final result of the claimed invention is not concrete.

MPEP 2106 recites, in part:

"A claim that can be read so broadly as to include statutory and nonstatutory subject matter must be amended to limit the claim to a practical application."

Accordingly, because the claims can be drawn to both statutory and nonstatutory subject matter (based on the legacy program), they are being rejected as not being drawn to statutory subject matter. The claims must be amended to limit a practical application.

***Response: 35 U.S.C. § 112 P2***

**6. Applicants argue:**

15. Claim 8 has been amended and the amendments are believed to overcome the rejection for dependent claims.

16. All claims are believed free of the grounds for rejection Claim 8.

(Rem

arks: page 11)

**7. Examiner Response:**

The rejection is maintained as the amendment only partially addresses the rejection of claim 8.

***Response: 35 U.S.C. § 102/103***

8. Applicants' arguments regarding the prior-art rejections have been fully considered but are **moot** in view of new grounds of rejection.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 1-6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

**MPEP 2106 recites, in part:**

"...USPTO personnel shall review the claim to determine it produces a useful, tangible, and concrete result. In making this determination, the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather on whether the final result achieved by the claimed invention is "useful, tangible, and concrete." (emphasis added)

9.1 The method claims do not produce a useful, tangible, and concrete final result. The steps of the

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method claims do not produce a useful, tangible, and concrete final result. Note exemplary claim 1 which only recites steps and does not produce a useful tangible and concrete result. See MPEP 2106. Which additionally, does not provide a concrete, useful, and tangible final result. The step of executing produces the final result. This step however does not produce a final result that is concrete, useful, and tangible. To not belabor the issue, attention is drawn above to section "Response: 35 U.S.C. § 101", subsection titled "Examiner Response".

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being **indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 8, the limitation contains a number of ambiguities which render the claim indefinite:

organizing the particular translated instructions into one or more particular translated blocks, each translated block including a plurality of contiguous translated instructions stored in a cache,

Specifically, the limitation before the limitation above translates a particular legacy instruction into **one** or more particular translated instructions, and the limitation above states that the translated instructions are translated into translated blocks and each block including a plurality of contiguous translated instructions. This raises an indefiniteness issue. Specifically, it conflicts with the "**one** or more particular translated instructions" limitation.

11. Claims not specifically mentioned are rejected by virtue of their dependency.
12. The Applicants are required to fix all other similar occurrences of the above-cited deficiencies.

### ***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 1 and 3, 5-8, 10, 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Morley (**US 5796989**) and in view of Official Notice taken.

Morley discloses: 1. A computer-implemented method for dynamic emulation of legacy instructions comprising:

translating the particular legacy instruction into one or more particular translated instructions for emulating the particular legacy instruction (**col: 3 line: 40-50**), organizing the particular translated instructions into one or more particular translated blocks (**col: 3 line: 40-50; col: 4 line: 18-22 - blocks ... each sequence (Fig 1 item 18)**), linking the particular translated blocks into a particular linked group corresponding to said particular legacy block; said linking using a link in each particular translated block to point to a location of the next particular translated block of the particular linked group (**Fig 1 item 18 and description - the linked list is functionally equivalent to the disclosed sequence of instructions; a linked list is merely a list (sequence) having a pointer which points to the next instruction. whereas a sequence is a list which inherently points and has a pointer to the next element in the list - otherwise, it would not be a sequence. A sequence however does not require unnecessary memory required to maintain the extra pointer.**), executing the particular translated instructions in the particular translated by executing the linked group translated blocks, said execution proceeding directly from each particular translated block to the next particular translated block (**col: 4 line: 15-30; col: 4 line: 24-26**).

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Morley however does not expressly disclose: accessing said **legacy instructions in legacy blocks**, each legacy block including a plurality of legacy instructions, for each particular legacy instruction in a particular legacy block performing the translation, organization, and linking steps above.

Official Notice is taken with respect to this limitation.

It would have been obvious to one of ordinary skill in the art <emulation / computer programming / emulation using cache> at the time of Applicant's invention to combine the features in order to save time associated with retrieving a single legacy instruction at a time. Retrieving multiple instructions in forms of blocks (chunks) is common place in the art and prevents bottlenecks as well as increases throughput of processing by loading in sections, rather than one-by-one. See, for example, additional motivation in Morley's **(col: 2 line: 1-9)** and Walters' **(US 5768593) (col: 4 line: 4-8)**. Morley discloses: 3. The method of Claim 1 wherein said particular translated instructions are stored in a cache and wherein said particular translated instructions are purged from said cache only when all said particular translated instructions of particular translated blocks are also purged from said cache **(col: 2 line: 6-9; col: 2 line: 14-16; col: 5 line: 65 to col: 6 line: 4 - when the new cache line is stored it overrides the previously stored cache line (which is a "block of information"))**.

Morley discloses: 5. The method of claim 1 wherein said legacy instructions are object code instructions compiled/assembled for a legacy architecture **(col: 3 line: 42-50; col: 3 line: 63 to col: 4 line: 4)**.

Morley discloses: 6. The method of Claim 1 wherein the translated instructions are for execution in a RISC architecture **(col: 3 line: 42-50; col: 3 line: 63 to col: 4 line: 4)**.

As per claim 7, note the rejection of claim 1 above. The Instant Claim recites substantially same limitations as the above-rejected claim and is therefore rejected under same prior-art teachings.

As per claim 8, note the rejection of claim 1 above. The Instant Claim recites substantially same limitations as the above-rejected claim and therefore rejected under same prior-art teachings, but for said logical group including a first translated block, one or more next translated blocks and a last block, said linking using a linked list in said cache including a first link in the first translated block that points to a location in the cache of a next translated block, one or more next links in the next translated blocks

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where each next link points to a location in the cache of a subsequent one of the next translated blocks, and a last link that points to the last block of the logical group **(identical rationale as provided above for the "linking" step of claim 1; the inside of the sequence inherently points to the following instructions, the second to last instruction inherently points to the last instruction in a sequence, etc).**

As per claims 10, 13-14, note the rejection of claims 1, 5-6 above. The Instant Claims recite substantially same limitations as the above-rejected claims and are therefore rejected under same prior-art teachings.

14. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morley (**US 5796989**) as applied to claim 1 above, and further in view of Scalzi (**US 5,540,013**).

As per claim 4, Morley discloses all limitations of claim 1. Morley, although enabled to use the invention for S/390 architecture, does not explicitly disclose using such architecture in the emulation of the legacy system (**col: 1 line: 40-44**). Scalzi however discloses an analogous emulation system having the said feature (**col: 17 line: 54-67**). It would have been obvious to one of ordinary skill in the art <hardware emulation / software emulation / PowerPC emulation / virtual machines / etc> at the time of Applicant's invention in order to use the programs developed for one system on another system without having to re-design and re-development the programs; thus, saving cost, time and effort.

As per claims 12, note the rejection of claim 4 above. The Instant Claims recite substantially same limitations as the above-rejected claim and are therefore rejected under same prior-art teachings.

15. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morley (**US 5796989**) as applied to claim 8 above, and further in view of Walters (**US 5,768,593**).

As per claim 9, Morley discloses all limitations of claim 8. Morley however does not expressly disclose said plurality of contiguous legacy instructions in the legacy block include one or more legacy branch instructions, where the translating step translates the legacy branch instructions to translated branch instructions, where the executing step executes said translated branch instructions and when a taken branch results in a branch target instruction within the logical group, the executing step directly executes the branch target instruction without requiring an external reference to look-up the location of the branch



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target instruction. Walters however teaches an analogous emulation system having the said feature **(col: 12 line: 10-32)**. It would have been obvious to one of ordinary skill in the art <computer engineering / emulation engineering / address translation> at the time of Applicant's invention to combine the references in order to reduce the time required to perform an address look up; thus, generating a faster emulator and saving time and costs associated therewith.

As per claim 11, Morley discloses all limitations of claim 8. Morley however does not expressly disclose where each legacy block has a number of translated blocks where the number of translated blocks differs for different legacy blocks. Walters however teaches an analogous emulation system having the said feature **(col: 13 line: 43-53)**. Specifically, the non-native instructions are non-native branch conditions which are translated into native branch instructions of varying lengths (minimum number of native code instructions used to handle non-native condition codes vary depending on the type of branch instructions). It would have been obvious to one of ordinary skill in the art <computer engineering / emulation engineering / address translation> at the time of Applicant's invention to combine the references in order to reduce the time required to perform an address look up; thus, generating a faster emulator and saving time and costs associated therewith.

***Support for Amendments and Newly Added Claims***

16. Applicants are respectfully requested, in the event of an amendment to claims or submission of new claims, that such claims and their limitations be directly mapped to the specification, which provides support for the subject matter. This will assist in expediting compact prosecution. MPEP 714.02 recites: "Applicant should also specifically point out the support for any amendments made to the disclosure. See MPEP § 2163.06. An amendment which does not comply with the provisions of 37 CFR 1.121(b), (c), (d), and (h) may be held not fully responsive. See MPEP § 714." **Amendments not pointing to specific support in the disclosure may be deemed as not complying with provisions of 37 C.F.R. 1.131(b), (c), (d), and (h) and therefore held not fully responsive.** Generic statements such as "Applicants believe no new matter has been introduced" may be deemed insufficient.

***Requests for Interview***

17. In accordance with 37 CFR 1.133(a)(3), requests for interview must be made in advance.

Interview requests are to be made by telephone (571-272-8634) call or FAX (571-273-8634).

Applicants must provide a detailed agenda as to what will be discussed (generic statement such as "discuss §102 rejection" or "discuss rejections of claims 1-3" may be denied interview).

The detail agenda along with any proposed amendments is to be written on a PTOL-413A or a custom form and should be faxed (or emailed, subject to MPEP 713.01.I / MPEP 502.03) to the Examiner at least 3 business days prior to the scheduled interview.

18. Interview requests submitted within amendments may be denied because the Examiner was not notified, in advance, of the Applicant Initiated Interview Request and due to time constraints may not be able to review the interview request to prior to the mailing of the next Office Action.

***Conclusion***

19. All claims are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Silver whose telephone number is (571) 272-8634. The examiner can normally be reached on Monday thru Friday, 10am to 6:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/ DS /  
David Silver, Patent Examiner

/Kamini S Shah/  
Supervisory Patent Examiner, Art Unit 2128

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